January 2017

NSSC This Month

U.S. Army Garri Natick Public Affairs Office

SUSS-taining Soldiers

New shelter system to help with short missions

2013 and 2015 U.S. Army
Maj. Gen. Keith L. Ware Awards
First Place, Digital Publication

NAGC 2016 National Association of
Government Communicators
First Place, External Newsletter

Commander's Corner

Brig. Gen. Anthony W. Potts
NSSC Senior Commander

An Exciting Start

What an exciting and busy start to the New Year.

I am honored and privileged to accept responsibility for the leadership of the Natick Soldier Systems Center. I am proud to join such a dynamic team that contributes so much to our Soldiers, service members and civilians across the military services. My expectations of this organization were very high, yet I was immediately impressed by the caliber of people who make up this team and the intricate way your projects are woven together to increase lethality and survivability of our most complex weapon system – the Soldier.

As the senior commander, my goal is to help you continue to do the great things that you do by securing resources and promoting your accomplishments. I will advocate on your behalf to ensure your priority efforts are understood and resourced.

To that end, we must focus our research efforts to ensure they directly link to Army priorities and operational needs. We will use our tremendous talent to fill gaps identified by the Army, enhance Soldier performance, provide products that exceed future requirements, and ensure the American Soldier enjoys superiority and overmatch on the battlefield.

Our adversaries never rest in their efforts to find and exploit weaknesses in our defenses, and we won't rest, either. Keep thinking, keep researching, keep finding better ways to protect and defend our Soldiers.

Thank you for your service to our nation. It is truly an honor to lead this team – Team Natick!

Brig. Gen. Anthony W. Potts
NSSC Senior Commander

NSSC This Month

NSSC
Senior Commander
Brig. Gen. Anthony W. Potts

Garrison Commander
Lt. Col. Ryan Raymond

Command Sergeant Major
Command Sgt. Maj.
Michael R. Pintagro

Public Affairs Officer
John Harlow

Editor
Bob Reinert

About this newsletter
NSSC This Month is a monthly newsletter covering NSSC news within the Army and commercial media.

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To subscribe to *NSSC This Month*, please contact Bob Reinert at robert.j.reinert.civ@mail.mil.

On the Web: www.army.mil/natick

Cover photo: Ariana Costa, NSRDEC

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NSSC News Briefs ...

Financial Readiness Courses

Financial fitness is right at your fingertips with new training for service members and their families. A series of five online training courses about money management is available covering the topics of consumer credit, developing your spending plan, and more. Visit the Military OneSource My Training Hub today at https://myhub.militaryonesource.mil/.

Civilian Wellness Program

Did you know that DA Civilians can take part in a six-month exercise program? While every organization has specific guidelines for employee participation, the Army Civilian Wellness Program allows civilian employees to exercise up to three hours per week during the duty day to help promote a healthier and more productive workplace. For more information, contact Natick Family and MWR at ext. 4791.

AER Scholarship

Army Emergency Relief has opened its scholarship application period for dependents of active-duty or retired Soldiers. Army Emergency Relief supports the Spouse Scholarship Program and the Maj. Gen. James Ursano Scholarship Program for dependent children. Scholarship specifics and applications are available on AER's website, www.aerhq.org, until May 1. Last year, AER awarded scholarships totaling $19,800 to one spouse and eight children from NSSC. For more information, contact Diane Magrane at diane.k.magrane.civ@mail.mil.

MWR Closure

The Lord Community Activities Center (Bldg. 32) will be undergoing some scheduled renovation work this spring and is expected to be closed from May 1 through July 4. For more information, please contact MWR at ext. 4791.

Overseas/PCS Assistance

ACS offers one-on-one briefing appointments for overseas relocation or other Permanent Change of Station (PCS) moves. Gain information on what you need to know about living overseas, or let us help you connect with your next duty station with welcome packets and other online resources. Briefings are available for both military and DoD civilians anticipating a PCS move. For an appointment, please contact Diane Magrane at diane.k.magrane.civ@mail.mil.

Garrison Spotlight

Sandra Novak

Photo: Tazanyia Mouton, USAG Natick Public Affairs

What Sandra does:

Sandra is the government information specialist, records manager, and supervisor and contracting representative for Mail & Distribution. This entails managing administrative services and ensuring information, records, mailroom operations and service remain at a high level of customer satisfaction and in accordance with governing regulations and law.

DHR director Emanuel Ingram on Sandra:

"Sandra has earned the reputation within the directorate and throughout NSSC for getting things done. She takes pride in her job and has a passion for providing quality and friendly customer service. Although she wears many hats, one in particular is that of mailroom supervisor. Sandra works diligently to not only ensure mail and distribution services are not disrupted, but highlights shortcomings and works closely with Natick Contracting Division to secure new contracts. Sandra is the true definition of a professional Department of the Army civilian."

Hanscom AFB Family Advocacy Program

NSSC Soldiers and civilians are invited to participate in classes offered by the Hanscom Air Force Base Family Advocacy Program held every Wednesday from 12 p.m. to 1 p.m. Classes cover a range of topics such as Stress and Anger Management, Parenting with Love, and Logic and Couple's Communication. For more information, contact Dawn Shewmaker at (781) 225-6385.

Chaplain's Office Counseling

If you are in need of a counseling appointment, chaplain coverage or religious support, please call the Chaplain's Office at ext. 4506, or the mobile line at (508) 202-2638. All communication during a counseling session with an Army chaplain and/or chaplain assistant is confidential.

Focal Point

All for Science

Providing innovative science and technology solutions for Soldiers on the battlefield requires extensive research in the area of human performance.

One of the ways the Natick Soldier Research, Development and Engineering Center improves the performance of individual Soldiers is through the U.S. Army's Human Research Volunteer program.

Human Resource Volunteer, or HRV, Soldiers play a vital role in the science behind Soldier performance. For 90 days, about 30 new Soldiers voluntarily come here to work directly with NSRDEC civilian scientists and engineers in support of human performance research.

During this temporary assignment, HRV Soldiers participate in sleep and nutrition studies inside Natick's climate chambers, field-test ruck sacks, footwear and uniform prototypes, let mosquitoes bite their arms and even tolerate an occasional film crew – all for science!

While their faces change, their contributions to Soldier technology are everlasting. NSRDEC recognizes and honors some of the faces who have served over the past year.

– Jeff Sisto, NSRDEC Public Affairs

Photos: Jeff Sisto, NSRDEC Public Affairs

Photo: David Kamm, NSRDEC

Maj. Gen. Cedric T. Wins, left, commanding general, U.S. Army Research, Development and Engineering Command, passes the colors to Brig. Gen. Anthony W. Potts, new RDECOM deputy commander and Natick Soldier Systems Center senior commander, at a Jan. 5 change of command ceremony at Natick.

Potts becomes NSSC senior commander

By Bob Reinert, USAG Natick Public Affairs/NATICK, Mass. (Jan. 5, 2017)

Brig. Gen. Anthony W. Potts assumed command of Natick Soldier Systems Center in a Jan. 5 ceremony at NSSC's Hunter Auditorium.

Potts will also serve as deputy commanding general of the U.S. Army Research, Development and Engineering Command, or RDECOM, at Aberdeen Proving Ground, Maryland. He comes to Natick from Redstone Arsenal in Huntsville, Alabama, where he was special assistant to the Program Executive Officer – Missiles and Space. Like his predecessor at Natick, Brig. Gen. Thomas H. Todd III, Potts is an Army aviator.

Todd departed Natick during the ceremony, which was hosted by Maj. Gen. Cedric T. Wins, RDECOM commanding general. An Alabama native, Todd will take charge of Program Executive Office – Aviation at Redstone Arsenal, but he said he won't forget Natick or its people.

"This assignment has truly made a difference in our lives," Todd said. "You have made an impact in our lives, and we will always be an adopted family (of Natick and New England)."

Todd talked about the many significant accomplishments, visitors and upgrades at NSSC in the year-plus that he was here. He urged the Natick workforce to carry on in his absence.

"Team Natick, stay strong, stay true to our Soldiers," Todd said. "It's never been about you. It's always been about young volunteers, sons and daughters. You are certainly going to do well at the task at hand – to provide those sons and daughters with unmatched capability so that they can accomplish the difficult task that our nation requires of them and return home safe."

Wins pointed out that in his time leading Natick, Todd had brought the NSSC community closer together.

"He has brought a diverse, joint, interagency, and intergovernmental team together through daily leadership, as well as the various projects that he has spearheaded and pushed in the right direction," Wins said. "This includes the development and the establishment of the new front gate (and) renovations to this … auditorium.

"He's also been busy as the Army senior leader in this region, telling the Army's story to the Massachusetts Congressional Delegation, and the governor of Massachusetts and state senators and representatives, so they'll have an appreciation of what the Army does and what the Army brings and how this particular installation and all the associated tenants could contribute to that effort.

"His role as the RDECOM deputy commanding general moved him from a regional and even national focus as Natick's senior leader to a global focus where research and development of key technologies will ensure our Soldiers remain the centerpiece of our Army."

Wins also spoke highly of Potts, detailing his extensive background prior to arriving at Natick.

"In a true Army tradition, a farewell to one great leader signals a pivot to another outstanding leader who will assume the mission, and that's Brigadier General Tony Potts," Wins said. "Brigadier General Tony Potts has earned the Army's trust, and I know he and his family will become treasured assets here in Natick as they take their place in a long line of commanders who have served here, and served here with distinction."

In his brief remarks, Potts said that he was happy to be at Natick.

"I'm a simple Soldier," Potts told the gathering. "God is first, my family is second, and my job is third.

"I'm looking forward to working with the entire community here. You do such amazing work."

Natick welcomes new CSM

Pintagro comes from Public Affairs background

By Bob Reinert, USAG Natick Public Affairs/NATICK, Mass. (Jan. 6, 2017)

In a change of responsibility ceremony Jan. 6, Command Sgt. Maj. Michael R. Pintagro took over as U.S. Army Garrison Natick command sergeant major.

Pintagro replaced Command Sgt. Maj. Erika M. Gholar during the ceremony in Hunter Auditorium. Gholar will retire in 2017 after 31 years in the Army. Pintagro comes to Natick from Kaiserslautern, Germany, where he was Public Affairs sergeant major for the 21st Theater Sustainment Command.

"Today is a great day that represents the best of traditions in the Army -- the link between the past and present, and the unique juxtaposition of change and continuity," said Lt. Col. Ryan Raymond, USAG Natick garrison commander. "Through it all, we remain one team committed to Soldier success."

Raymond said that Gholar had been instrumental in achieving the senior commander's vision of Team Natick, on and off the installation, over the past two years.

"Many of you have witnessed the fierce tenacity with which she approached Soldier well-being," Raymond said. "She's a kind but strong leader. She mentored all the NCOs on the installation regardless of background, regardless of unit, MOS, grade. And she put civilian mentorship and development and standards and performance at that same level."

According to Raymond, improving quality of life at Natick was a Gholar priority.

"She listened to anyone and everyone," Raymond said. "She was there for every member of our team.

"However, her influence and commitment to the Army extended much further. If you want to see Command Sergeant Major Gholar in her element, you need to see her when she's representing the installation to the outside community."

Photo: David Kamm, NSRDEC

Lt. Col. Ryan Raymond, center, is flanked by incoming Command Sgt. Maj. Michael R. Pintagro and outgoing Command Sgt. Maj. Erika M. Gholar at the Jan. 6 change of command ceremony at USAG Natick.

Gholar thanked Raymond for his kind words but then chose to shift the spotlight to the numerous Natick employees who quietly keep the installation running successfully.

"They are the people that work behind the scenes, day in and day out, and sometimes I think we don't thank them enough," Gholar said. "They are truly the people who make the scientists, the technicians and the leadership that are sitting in this room really shine on the brighter stage.

"NSSC, I love you. I appreciate you. You hold a very dear, special place in my heart. Germany was my first assignment. You're my last assignment. I want you to know this: When I leave, I will take you with me."

Raymond welcomed Pintagro, who arrives at Natick with more than two decades of Army leadership experience.

"As always, the Army has provided us another superior leader to fill the critical role of command sergeant major," Raymond said. "Command Sergeant Major Mike Pintagro and his family join us from Germany. They are … ready to continue their practice of supporting Soldiers in the public light.

"As a Public Affairs sergeant major, he is accustomed to telling the Army's story. Being from Alabama, Mike, you may find that Natick seems to be more like a foreign country than you know – but you'll quickly come to love it just like you did Europe."

Pintagro said he would work "diligently" on his Boston accent.

"I'm delighted to be here and immensely grateful for the highly underrated Yankee hospitality, as well as the terrific opportunity," Pintagro said. "I look forward to serving with this dynamite team, sharing in its bright future, and helping to deliver the finest support to our Soldiers and civilians."

Photo: Department of Defense

An Army weapons squad engages North Korean positions on Nov. 20, 1950.

Legal Corner

Integrating the military

Truman's 1948 executive order paved the way

By Capt. Briana S. Tellado, Command Judge Advocate

African-Americans have served as essential members of the United States Armed Forces, even before there was a "United States."

In fact, one of the first casualties of the Revolutionary War, an African-American patriot named Crispus Attucks, was killed by the British during the Boston Massacre in 1770.

When the Continental armies were organized under General George Washington, his policy was that there would be no African-American troops. The British seized the opportunity, offering freedom for all slaves who defected to the British side. Then realizing the immediate consequences of the ban on African-American troops, individual states relaxed their enlistment standards. Some states formed entirely black companies, while other states allowed totally integrated units like we see today.

Segregation in the U.S. forces remained largely unchanged from the time of the Revolutionary War to World War I. Although the Army allowed African-American troops to serve, they were still segregated. The Navy only allowed African-Americans to serve in food service occupations. The Marine Corps did not allow any African-Americans at all.

Photo: U.S. Air Force

In 1941, the War Department developed a pilot program to test the success of African-Americans in the Army Air Corps. Until then, African-Americans were not allowed to serve in what we now call the Air Force.

The "Tuskegee Experience," as it was called, graduated its first class in 1942. The Tuskegee Airmen trained at Tuskegee University, a Historically Black College in Alabama, and at Tuskegee Army Airfield.

From 1941 to 1949, the Tuskegee Airmen trained as pilots, navigators, bombardiers, instructors, maintenance, and support staff. In total, 996 pilots were trained, with an additional 16,000 to 19,000 support personnel graduating from the program.

From 1941 to 1949, the Tuskegee Airmen trained as pilots, navigators, bombardiers, instructors, maintenance, and support staff. In total, 996 pilots were trained, with an additional 16,000 to 19,000 support personnel graduating from the program. They served with distinction in their new roles, earning multiple combat awards during World War II, including 150 Distinguished Flying Crosses.

The success of the program became an obvious example for President Harry S. Truman to rely upon in issuing Executive Order 9981, which ordered the integration of the Armed Forces in 1948. Although the Executive Order required the services to put the new policy into effect "as rapidly as possible," the change did not come about immediately.

Although the Army had the first "integrated" unit in the services, it was not truly integrated. The "integrated" unit consisted of all-white platoons and all-black platoons, but serving under the same command.

At the start of the Korean War in 1950, there were still all-black units commanded by white officers, including the 24th Infantry Regiment. First Lt. Leon A. Gilbert Jr. fought with the 24th and became commander of Alpha Company after the original commander was wounded in battle.

In July 1950, about a month into the Korean War, Gilbert and 12 of his men withdrew from their positions after being outnumbered by enemy sniper fire. Gilbert's regimental commander ordered him and his men back to their forward positions.

Gilbert, a 10-year Army veteran who previously served in Italy during World War II, refused the order, calling it a suicide mission. He was sure that a white commander would not have ordered a dozen white Soldiers into what he considered certain death.

Gilbert was tried by court-martial for misbehavior before the enemy, found guilty and sentenced to death. Public opinion largely agreed that the charge against Gilbert was racially motivated.

In July 1951, the Army announced its plans to de-segregate its force. Truman later commuted Gilbert's sentence, and he was released after serving five years in prison.

While it may be hard to believe, the Armed Forces were ahead of the times. Six years after Truman ordered integration in the Armed Forces, the Supreme Court held that state laws ordering separate schools for black children and white children were unconstitutional. Citing the 14th Amendment's Equal Protection Clause, it reasoned that the idea of "separate but equal" educational facilities was nonsense, because "separate educational facilities are inherently unequal."

SUSS-taining Soldiers

New shelter system to help with short missions

By Jane Benson, NSRDEC Public Affairs/NATICK, Mass. (Dec. 20, 2016)

The NSRDEC Expeditionary Basing & Collective Protection Directorate is designing a Small Unit Sustainment System, or SUSS (pictured here). The goal is to reduce the logistical burden while increasing the self-sufficiency and quality of life for squads and small units.

Photo: Ariana Costa, NSRDEC

What's all the SUSS about?

A new sustainment system that will meet the billeting needs of small units on the move is being designed by the Natick Soldier Research, Development and Engineering Center's Expeditionary Basing & Collective Protection Directorate, or EB&CPD.

The Small Unit Sustainment System, or SUSS, will reduce the logistical burden while increasing the self-sufficiency and quality of life for squads and small units.

"It's two shelters that will support a small unit during missions of 72 hours, without the need for resupply of fuel," said Ariana Costa, program integrator, EB&CPD, and project officer for the SUSS.

"The system serves those who are operating on the move and who need to set up and take down a system quickly to move on to the next location. All of the equipment is transported on the two trailers, which are towable behind a Humvee."

The SUSS is designed to improve Soldier quality of life and performance by eliminating the need to find makeshift billeting solutions – the nature of which can sometimes lead to sleep deprivation and lack of proper hygiene capabilities, affecting performance, health and morale.

NSRDEC researchers have determined that the SUSS is well-suited for humanitarian and disaster relief or expeditionary command post applications.

"Part of why this project came about is that we were faced with a capability gap for short mission durations," said Costa.

"Generally, when an Army unit goes out in the field and they don't have shelter provided for them, they provide their own and will sleep in vehicles in inclement weather," said Jay Kopp, an NSRDEC equipment specialist who also served in the infantry for 23 years.

"The SUSS concept was developed where you can have a platoon-size element go out to the field with these systems that provide command and control elements. Anyone who has slept in a vehicle for more than a couple of hours knows that the sleep that they get is not quality. This system gives them a place to bed down and get better sleep than what they would outside."

The SUSS is designed as a small tactical operations center, or TOC, and includes a generator, LED lighting, environmental control units for heating and cooling, solar panels, and a portable latrine and shower. The system is energy efficient and with proper training can be set up by a team of eight in under an hour. The system is intended for use in all temperatures.

"It's designed to be used in the whole operational temperature range, but we have heaters for extremely low temperatures instead of ECUs," said Costa. "Other than that, the system is designed to function throughout the entire temperature range of minus 40 to 120 degrees Fahrenheit."

NSRDEC actively sought all-important Soldier input throughout the development process, working extensively with the 25th Infantry Division to set up, operate and tear down SUSS, and to make observations and gather feedback about Soldier needs and how to make the system better.

"The SUSS is a great product for the small TOC," said Sgt. Maj. Kalep Perez Gonzalez, G4/ACoS sergeant major for the 25th Infantry Division. "Once it is set up, it gives the unit all the capabilities of a large TOC kit but with a small package. It is almost completely self-sustaining, so it allows the unit more independence. The solar panels help with extending the fuel life cycle. The battery backup lessens fuel consumption. It makes very little noise and is light and ready for us to use. It provides shelter comforts, including latrines and showers. No other tent system has a way to control the lights, ECUs, from the same place. I think as a small TOC kit for an expeditionary unit, the SUSS has no equal."

Andrew Wood, experimentation director at U.S. Army Pacific, said it was gratifying and motivating to work this project at the request of Perez Gonzalez.

"If a senior NCO sees potential in a technology to fill a capability gap, it is well worth the effort to assess it," said Wood. He noted that using the SUSS in several exercises provided "multiple and various situations to get great feedback to the technical team so they can make the next version even better."

> **"Anyone who has slept in a vehicle for more than a couple of hours knows that the sleep that they get is not quality. This system gives them a place to bed down and get better sleep than what they would outside."**
>
> Jay Kopp, NSRDEC equipment specialist

"The Special Troops Battalion, 25th Sustainment Brigade was excited for the opportunity to evaluate the SUSS," said Lt. Col. Steven W. Morris, commander, 25th STB BDG, whose Soldiers used it on several field training exercises in Hawaii.

"For our last evaluation, the (battalion) staff took comparisons of the SUSS versus our medium (Deployable Rapid Assembly Shelter). The SUSS took less time to set up and tear down. The SUSS also required fewer personnel. The SUSS proved to be low maintenance, easy to establish and break down. The Soldiers enjoyed the control panel (TOC Box) that made it easy to manipulate the lights and temperature of both tents.

"While it is not large enough for a battalion TOC, the SUSS is the right size for a company command post. I would have loved to have this system when I was a company commander," Morris said.

"Going out in the field and working with Soldiers is my favorite part of my job," said Costa. "I think it is so important that, as the developers of the next generation of expeditionary basing shelters and equipment, we get to see what Soldiers need and what their problems are so we can help solve them. You can't do that without going out to the field and talking to them directly and seeing them work with the equipment."

"If you don't take care of yourself in the field with proper rest and the ability to maintain proper hygiene, you're hurting yourself and your ability to do your job – which impacts the entire unit," said Kopp. "So any help you can get will definitely improve your quality of life and your performance out there and help you to do your job and do it properly.

"As a Soldier, you have to keep yourself in the fight, and this system helps."

Photo: David Kamm, NSRDEC

Massachusetts Governor Charlie Baker, center, holds the Ballistic Combat Shirt, which was invented by Robert DiLalla, far left, of NSRDEC. At far right is Brig. Gen. William E. Cole, then senior commander of the Natick Soldier Systems Center.

NSRDEC makes Army Top 10

Ballistic Combat Shirt named to 2016 list

By David Vergun, Army News Service/WASHINGTON (Dec. 28, 2016)

Supporting the fight around the globe means having the best technologies for Soldiers to ensure overmatch against future adversaries in an increasingly complex and dangerous world where the threat is often "elusive and ambiguous," said Army Vice Chief of Staff Gen. Daniel B. Allyn, speaking at an industry event in Michigan, Oct. 27.

This environment will place a premium on unmanned systems, lethal technologies and rapid maneuver capabilities, he added.

The Army will need to ride the wave of technology or risk being left behind, cautioned Lt. Gen. Michael E. Williamson.

Consumer electronics are advancing at an "incredibly rapid pace. The average time to obsolescence of some devices, such as home computers and smart phones, is as fast as 24 months," said Williamson, who is the principal military deputy to the assistant secretary of the Army for Acquisition, Logistics and Technology. He spoke at a "Network Readiness in a Complex World" panel hosted by the Association of the United States Army in July.

In 2016, Army researchers and scientists, along with industry partners, continued to make great strides in modernization. Following is a sampling of 10 of the top advancements and milestones. Some of the many others not included can be found in the "related links" section of this page.

30MM CANNON FOR STRYKER

The first prototype Stryker Infantry Carrier Vehicle, outfitted with a 30mm cannon, was delivered to the Army Oct. 27.

The upgraded Stryker vehicle will be known as the Dragoon, the name of the 2nd Cavalry Regiment. The prototype also features a new fully integrated commander's station, upgraded drivetrain componentry and hull modifications, according to a press release from Program Executive Office-Ground Combat Systems.

The Urgent Operational Needs statement submitted in March 2015 resulted in a directed Stryker lethality requirement, one that included an accelerated acquisition effort to integrate the 30mm cannon on the vehicles, he said.

According to PEO-GCS, the Army has provided programmatic direction to initiate the first two elements of the Stryker Fleet Lethality strategy: providing an under-armor Javelin capability for the Stryker and improving the capabilities of the Stryker Anti-Tank Guided Missile vehicle to better locate and engage targets via networked fires.

LIGHTWEIGHT BALLISTIC SHIRT

When Army engineer Robert DiLalla set out to develop a new design for Soldier protection, he knew he had to break the mold.

The result of his revolutionary approach, which focuses on the Soldier as an athlete, is the game-changing Ballistic Combat Shirt, a new lightweight body armor system.

"We set out with this science and technology effort to meet the needs of high-performance athletes, which is what Soldiers are," said DiLalla, the team leader of the Infantry Combat Equipment Team at the Natick Soldier Research, Development and Engineering Center.

"I was really focused on the human. How can we do something that, without sacrificing protection, makes them feel like they are not wearing protection and improves their ability to do Soldier tasks?"

"This capability significantly increases the protection and flexibility of our personal protective ensemble, ensuring we are giving our Soldiers the edge they need," said Douglas A. Tamilio, NSRDEC director.

The invention is a departure from the Interceptor Body Armor system, which was an advancement when it was developed for the Marine Corps in the late 1990s. Over the years, however, the armor system increased in complexity and bulk. As additional components were added, it became difficult for Soldiers to put it on. In contrast, the Ballistic Combat Shirt is easy to don.

"So now instead of having to attach all of these components, you can throw it on like a goalie shirt in hockey," DiLalla said. "It goes on and you don't need a buddy to help you don the system. It's form-fitting so the Soldiers like it. Instead of one panel, the deltoid section is three panels. It's contoured so it stays with you. It moves with you. It has an improved range of motion."

The shirt weighs 35 percent less than the current Interceptor Body Armor system components it replaces and is less bulky.

"The Soldiers have spoken loud and clear with more than 90 percent user acceptance in multiple user evaluations," said DiLalla. "Typically, as we assess new body armor components, we'd consider 60 percent a successful number. So we were quite surprised."

DOUBLING HOWITZER RANGE

Picatinny Arsenal engineers have been working to create a longer, newly modified M777A2 howitzer that has the potential to double the system's current artillery range.

The modification, called the Extended Range Cannon Artillery, or ERCA, adds six feet to the cannon and less than 1,000 pounds to the overall system. A mobility demonstration is the first step to determine if the howitzer can be modified for extended range, or if a new system is required. Mobility testing will be conducted at Aberdeen Proving Ground, Maryland, in the near future.

The M777ER program will ensure that ERCA's system is suitable for the M777 system. The final ERCA system will be demonstrated with an M109A7 system, the Paladin self-propelled howitzer.

NEW HAND GRENADE

Engineers at Picatinny Arsenal are working on the first new lethal hand grenade in more than 40 years, which is designed to give greater flexibility to the warfighter.

The multi-purpose hand grenade design will provide both fragmentation and blast overpressure more effectively and safely than its legacy counterparts. Once fielded, Soldiers will be able to select and use a hand grenade with different effects simply by flipping a switch, said Jessica Perciballi, ARDEC project officer for Enhanced Tactical Multi-Purpose, or ET-MP, Army, Grenades & Demolitions Division.

Soldiers will not need to carry as many types of hand grenades, Perciballi said.

Another feature is that the new grenades are designed for ambidextrous use, meaning they can be thrown with either hand. Current grenades require a different arming procedure for left-handed users.

JLTV DEBUT

The first seven joint light tactical vehicles were turned over to the Army and Marine Corps in late September by Oshkosh Defense for testing at different sites around the force.

A total of about 100 of the JLTV "production vehicles" will be provided to the Army and Marine Corps for testing over the next year, at a rate of about 10 per month, officials said. The vehicles will undergo maneuverability and automotive testing at Yuma Proving Ground, Arizona, and other sites around the country.

The JLTV is a tactical wheeled vehicle with a chassis that offers protection from underbelly blasts and an "intelligent" suspension system that can be raised and lowered for off-road conditions. It also touts greater fuel efficiency than current tactical vehicles.

In addition to testing at Yuma, the vehicles will undergo testing for cyber integration of command, control, communications and intelligence at the Electronics Proving Ground on Fort Huachuca, Arizona. The vehicles will also be tested for automotive performance at Aberdeen Proving Ground, Maryland and the Cold Regions Test Center on Fort Greely, Alaska.

QUANTUM PHYSICS

At the U.S. Army Research Laboratory, scientists are looking at new ways to exploit the most fundamental or "quantum" component of light – the photon – to enhance communications, sensing and cryptography, and anything else they can think of.

A single photon, on its own, can be captured in a memory unit – or "quantum storage" – and subsequently measured. The measurements can be recorded, as well. But when two entangled photons are captured and measured in the same way, they yield the same measurements every time.

Those same two entangled protons could be split up, on different sides of the lab, on different sides of a research campus, or on different sides of the country, and still, because they are entangled, they behave the same way, and so they yield the same measurements no matter where they are.

A critical part of cryptography and secure communications is the use of random numbers. On both sides of the communication, both parties will need the same string of random numbers to encrypt that communication. If both parties had one half of an entangled pair of photons, then they would both have an endless supply of random numbers at their disposal, and those random numbers would be the same. So a pair of entangled photons, distributed to two parties, could be used to encrypt communications between the two parties.

Finding ways to distribute entangled photons, and using those entangled photons for secure networking are just two challenges that ARL is working on now. But they are looking at other ways to use entangled photons, as well, such as enhancing sensors and quantum computing, for instance.

NEW ARMORED VEHICLE

The Army received the first armored multipurpose vehicle, or AMPV, Dec. 15 for testing.

The AMPV demonstrator rolled out of the BAE Systems plant in York, Pennsylvania, to begin a 52-month engineering and manufacturing development phase for the vehicle. At least 29 of the vehicles will be manufactured for this phase of the procurement process, officials said.

If the low-rate production option for the AMPV is approved, procurement officials said several hundred of the vehicles will be manufactured for testing over the next four years.

The AMPV will replace the armored brigade combat team's M113 family of vehicles. The AMPV addresses the M113's shortcomings in survivability and force protection, and size, weight, power, and cooling, known as SWAP-C, officials said. It is also designed to incorporate future technologies and the Army's network.

The AMPV has a brand-new hull, but it maintains some of the Bradley legacy design, allowing for some compatibility efficiencies, according to Maj. Gen. David G. Bassett, Program Executive Officer for Ground Combat Systems. In fact, about 60 to 70 percent of the parts are common with existing ground combat vehicles, Bassett said during a press conference in October.

The AMPV also has space inside to allow for the addition of new systems in the future, and it comes with an improved power train. The hull is stronger from a force protection perspective, too, he said.

Meanwhile, many Bradleys are still in service, "so we're building new capabilities in an incremental way over time," Bassett said.

HYDROGEN-POWERED VEHICLE

The Army Tank Automotive Research, Development and Engineering Center and General Motors unveiled an energy-efficient tactical vehicle that could one day save lives on the battlefield.

The ZH2 hydrogen-fuel-cell electric vehicle prototype was rolled out Oct. 3, during the Association of the United States Army Annual Meeting and Symposium.

Kevin Centeck, team leader for Non-Primary Power Systems, Ground Vehicle Power and Mobility Directorate, TARDEC, said the vehicle comes with several advantages for the Army and Soldiers in the field.

First, the ZH2 operates on hydrogen fuel instead of traditional diesel. It uses much less fuel than traditional tactical vehicles. At idle, it is "extremely efficient," Centeck said. This should reduce the logistics train.

Second, since the vehicle uses hydrogen with electric power, it has an extremely low acoustic signature, meaning it's very quiet. "It's silent mobility, silent watch," Centeck said. "You don't give away your position by turning on the engine."

Third, the ZH2 has a radically reduced thermal signature because it doesn't operate as hot as a diesel engine, which means the heat signature is harder to pick up by enemy thermal sensors, providing additional stealth for Soldiers.

A fourth, less direct, but nonetheless important advantage cited by Centeck, is that the ZH2 demonstrated that the Army could build such a vehicle rapidly, using mostly off-the-shelf parts. The ZH2 took just one year from concept to delivery. The vehicle itself is basically a Chevy Colorado platform.

NEW TOURNIQUET

Hemorrhage control is the No. 1 thing you can do to save lives on the battlefield, according to Lt. Gen. Nadja Y. West.

"Stop the bleeding as soon as you can, and stop it as much as you can," said West, who serves as surgeon general of the Army and commander of the Army Medical Command. She spoke Aug. 18, at a meeting of the Defense Writer's Group in Washington, D.C.

One of the latest advances in treating hemorrhaging on the battlefield, West said, is what is known as the "junctional tourniquet," which can be applied to wounds in ways not possible with conventional tourniquets.

Traditionally, a medic or fellow Soldier can apply a tourniquet just to a person's limb, she explained. A traditional tourniquet cannot be used to stop hemorrhaging in the abdomen, chest, groin, waist, pelvis or armpit.

Developed at Army Medical Research and Materiel Command, Fort Dietrick, Maryland, the junctional tourniquet is essentially a belt with one or more inflatable air bladders that can be puffed up, somewhat like a blood-pressure cuff, to apply pressure to a wound.

The device can be deployed to stop hemorrhaging in about 60 seconds.

The junctional tourniquet is now being fielded to Soldiers in harm's way, but it's so new – just months since fielding – that West hasn't yet been briefed on how many lives it has saved, though she believes the number will be significant over time.

The new tourniquet is currently being fielded only to medical personnel, though it may in the future become available to line troops, she said.

IMPROVED TURBINE ENGINE

Degraded lift capability is especially problematic in areas where high-altitude, high-temperature flights are required, including nearly half of Afghanistan, said Maj. Gen. William K. Gayler.

Gayler, commander, U.S. Army Aviation Center of Excellence and Fort Rucker, Alabama, spoke at the Army Aviation Association of America-sponsored 2016 Army Aviation Mission Solution Summit in Atlanta, April 29 and 30.

Using the UH-60 Black Hawk helicopter as an example, Gayler said an average of about 78 pounds per year have been added annually – for all the right reasons. That includes increased protective gear, ammunition, new technologies and so on. Over the years, those increases have totaled about a ton-and-a-quarter.

All of that weight affects speed, lift, range, maneuverability and the amount of stuff that can be carried, he said.

Years ago, four Black Hawks could move a platoon, he pointed out. Now, it takes eight or nine and by 2020 – assuming the linear weight increases continue at the current rate – it will take 15 to 20, he said.

The Improved Turbine Engine Program, or ITEP, is a completely new engine that will likely one day replace those currently in the AH-64 Apache and Black Hawk helicopters, Gayler said. It will return a lot of that lost capability.

"ITEP is critical," he said. "We must get it right to buy back maneuverability."

Brig. Gen. Bob Marion, Program Executive Officer-Aviation, said ITEP is a big deal for the Army and it will be resident in about 85 percent of its platforms.

It also has potential for Future Vertical Lift, or FVL, if not the motor then pieces of the technology, he said.

FVL's engineering and manufacturing development doesn't begin until fiscal year 2024 with the first aircraft test in FY26.

(Contributing to this article were: C. Todd Lopez, Gary Sheftick and David Vergun of the Army News Service; Jane Benson, Natick Soldier Research, Development and Engineering Center public affairs; along with Lauren Poindexter and Eric Kowal of Picatinny Arsenal public affairs)

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By wearing eye protection, Soldiers greatly reduce the number and the severity of eye and facial injuries.

Photo: Spc. Christopher Brecht

Eyeing Risk

Work at NSRDEC helps Soldiers, children

By David McNally, ARL Public Affairs/ABERDEEN, Md. (Dec. 6, 2016)

Risk may be unavoidable for Soldiers, but Army-funded research hopes to use science and technology to make their job safer by reducing the risk of eye and facial injuries from projectiles. The same research is also making toys safer for children.

A team of Virginia Tech researchers published findings that have become what they call, "the gold standard for minimizing eye and face injury risk," not only for the military, but many toy manufacturers who now use the same studies to make safer consumer products.

Thousands of research hours and analysis went into the studies funded by the U.S. Army. Virginia Tech researchers published their work in scientific journals. Consumer product companies then picked up on these publications and started using them to make toys safer. This led to the Virginia Tech researchers to assist companies in the design of products such as squirt guns.

"We helped design a lot of the Nerf darts to make sure there is no eye injury risk," said Dr. Stefan Duma, Virginia Tech Harry C. Wyatt professor and interim director of the Institute for Critical Technology and Applied Science at Blacksburg, Virginia. "We look at toy helicopter design or any kind of consumer product, even light sabers or anything that could be a projectile into the face of kids. We help design those to minimize eye injury risk."

Virginia Tech has the world's largest injury biomechanics group.

"We partner closely with the Army to understand blast injury and to help look at ways of preventing those types of injuries to the Soldier," he said. "Going back to the early 2000s, I've done a lot of work with the Army looking at eye and face injuries in Soldiers and the prevention of these injuries," he said. "We did a lot of basic research for about the past two decades quantify-

ing eye injury risk from projectiles, as well as facial fracture risk."

The Virginia Tech researchers developed a standalone dummy called the Facial and Ocular Countermeasure Safety, or FOCUS, headform.

"Imagine a dummy head, one that has special sensors in it that can measure eye injury risk and facial injury risk," Duma said. "We developed tools that accurately quantify risk of injury from projectiles."

Researchers used the dummy to assess risk by measuring the force applied to the eye during testing using toys such dart guns, foam launchers and a ball launcher.

The Army took advantage of this data to help in the use and development of goggles, and even mandated their use.

"The number of injuries has come down with the use of protective eyewear," said Michelle Markey, a researcher with the U.S. Army Natick Soldier Research, Development and Engineering Center at Natick, Massachusetts. "Although you can't prevent all injuries, the majority can be avoided, or reduced in severity, by wearing the proper protection."

The U.S. Army Research Laboratory funds university research to advance science to make Soldiers stronger and safer.

"Discoveries and innovations made with our academic and industrial partners are infused into the Army's S&T laboratory portfolio and create new scientific discoveries needed for technical advances to help ensure the Army maintains its technological edge," said Army Research Office Director Dr. David Skatrud. "The U.S. Army Research Laboratory funds academic research in universities to utilize this great national intellectual resource to focus on Army-relevant technical programs that result in benefits to the future Army."

In many cases, the Army's university research funding has provided key components to disruptive new technologies. For example, the invention of the laser and ultra-precise clocks needed for GPS.

"Current research is expected to provide similarly revolutionary advances, like quantum information sciences for ultra-secure networking and communications," Skatrud said.

Duma said it feels great to know his work is not only helping Soldiers, but minimizing eye and face injuries on children.

"Nowadays it's almost once a week that I get a call or an email from a toy company asking about this research" he said. "They're very interested. Even now we're getting into drones, and toy drones. We're using the same risk functions that we developed for the Army. What happens if a kid flies a drone into his face? What's the risk of injury?" It's a very fulfilling part of the job and we're happy that we can have these sort of translational and global impacts.

It all goes back to that basic science research that the Army supported, he said.

"The Army's ability to invest research funds in universities and institutions is absolutely critical if we want to advance the scientific mission," Duma said. "We want to protect the Soldier, but we can also protect civilian applications as well."

Photo: Chris Hart, CASCOM Public Affairs

Soldiers from the 266th Quartermaster Battalion serve others in a training exercise at the Quartermaster Field Operations Training Branch, Fort Lee, Va.

Soldiers test future ration options

By Chris Hart, CASCOM Public Affairs/FORT LEE, Va. (Dec. 5, 2016)

The Army is working on adding some new items to its meal ration menu.

In November, Soldiers from T Company, 266th Quartermaster Battalion, got a chance to taste test the latest dishes created by engineers from Natick Soldier Research, Development and Engineering Center to determine whether the new offerings should make it to the field.

"[Unit group rations] must be warfighter-tested and warfighter-approved," said Beverly Hamlette, a quality assurance officer for field testing at the Joint Culinary Center of Excellence at Fort Lee.

Natick brought the new dishes to the Quartermaster Field Operations Training Branch to gather Soldier feedback on the new rations. Soldiers were asked to score each item based on its degree of tastiness.

The test items included a breakfast of turkey sausage links – for Soldiers who do not eat pork products – eggs and biscuits, and a dinner option of meatballs, pasta and brown gravy.

The new rations are being developed according to taste, nutritional value and Soldier preference, said Meg Walker, Natick project officer.

Hamlette said she was pleased that the Soldiers had the opportunity to provide feedback. Natick will present the data from this test to the Army and Fort Lee Joint Service Operations Forum in February.

"We may not have Chipotle just yet, but we do look at trends and nutrition changes that may benefit our Soldiers and warfighters down range," she said.

High-Pressure Situation

Inactivating bacterial spores at NSRDEC

By NSRDEC/NATICK, Mass. (Jan. 27, 2016)

High hydrostatic pressure technologies are used in numerous applications, from preparing ceramic composites for aircraft, industrial diamond production, pharmaceuticals and cosmetics, and, more recently, pasteurizing food.

Photo: David Kamm, NSRDEC Strategic Communications

Dr. Christopher Doona and Florence Feeherry of NSRDEC

Research scientists at the U.S. Army Natick Soldier Research, Development and Engineering Center have found new applications for high pressure: inactivating bacterial spores that cause Anthrax (Bacillus anthracis) or other pathogenic spores (Clostridium difficile, the notorious microbe of concern in hospitals and nursing care settings).

"High pressure is a unique tool for inactivating spores or investigating their mechanisms," said Dr. Christopher Doona, a leading researcher in nonthermal technologies and co-editor of the landmark book *High Pressure Processing of Foods*.

Doona has published numerous peer-reviewed articles, patents and two different review articles (see bibliography below).

While high pressure is used in commercial equipment (as large as 525 liters) to pasteurize refrigerated foods such as juices, meats, seafood products, cold-serve soups and dips, high pressure has not yet been implemented for the production of commercially sterile foods for a combination of reasons.

"Food sterilization (done for some military rations, NASA foods and baby food purées) requires inactivating spores of Clostridium botulinum," says research microbiologist Florence Feeherry (co-editor of *High Pressure Processing of Foods*), "which requires high hydrostatic pressures in conjunction with high temperatures."

In an alternative application, Doona and Feeherry used hydrostatic pressure in combination with moderate temperatures to kill a Bacillus anthracis spore surrogate on self-decontaminating textiles.

"High hydrostatic pressure killed the Bacillus anthracis surrogate readily," said Doona. "And high pressure is also chemical-free, so it provided a way to decontaminate textiles without using harsh chemical regimes."

Interestingly, many studies with high hydrostatic pressure used Bacillus spores as surrogates, which can be quite different from Clostridium species," said Feeherry. "We recently published a study of the high-pressure germination of Clostridium difficile spores and Clostridium perfringens spores. The results demonstrated some of the differences between Bacillus and Clostridium spores – it was both remarkable and compelling."

Doona and Feeherry have another publication coming out soon on spore germination using another nonthermal technology with cross-over potential for textiles: cold plasma. Cold plasma has the potential to eliminate biofilms that degrade textiles or contaminate water lines.

"We look forward to continue moving science and technology forward in cross-cutting areas for the benefit of the Soldiers in support of Natick's mission," said Doona, "and to know our research is so highly valued scientifically and for its real-world applications at Natick and in the international scientific community."

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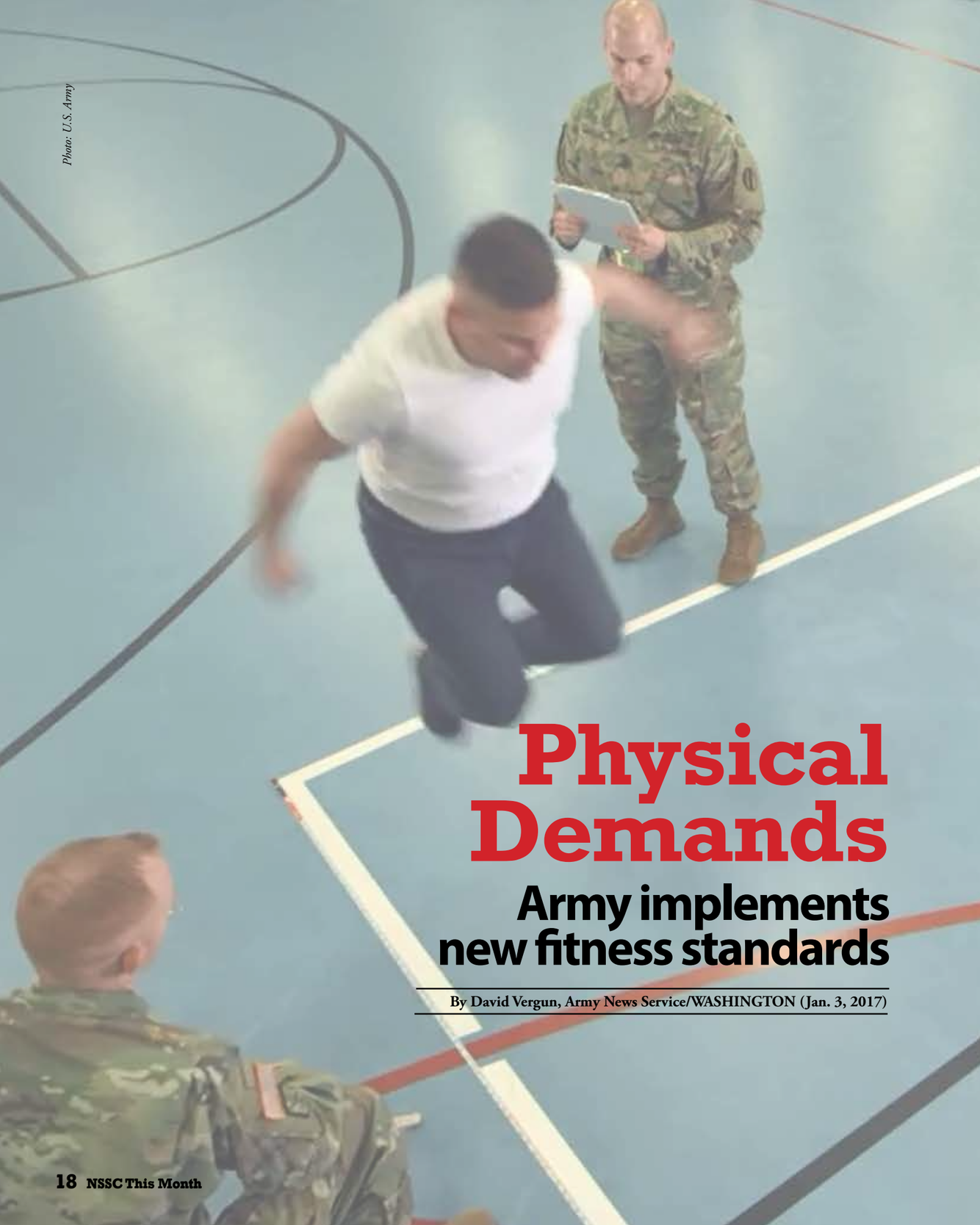

Photo: U.S. Army

Physical Demands

Army implements new fitness standards

By David Vergun, Army News Service/WASHINGTON (Jan. 3, 2017)

On Tuesday, the Army will begin administering the Occupational Physical Assessment Test, or OPAT, to all recruits to assess their fitness for military occupational specialties. The OPAT also will be used to assess some Soldiers who are reclassifying into a different MOS.

Army Recruiting Command estimates that the OPAT will be administered to about 80,000 recruits and thousands of cadets annually. Soldiers moving into more physically demanding MOSs also will have to meet the OPAT standard, said Jim Bragg, retention and reclassification branch chief for Army Human Resources Command.

Under the OPAT, there are four physical demand categories, Bragg explained.

- Heavy (black).
- Significant (gray).
- Moderate (gold).
- Unqualified (white).

When a Soldier wishes to reclassify to a new MOS, from the significant category to the heavy category, for example, he or she will need to take the OPAT. However, a Soldier whose new MOS falls within the same or a lower level physical demand category will not need to take the OPAT.

The Soldier's commander will be responsible for ensuring the OPAT is administered prior to approval of a reclassification, Bragg said. As with any reclassification action, the battalion-level or brigade-level career counselor will administer the OPAT.

When it comes to recruiting, Brian Sutton, a spokesman for Army Recruiting Command, said the OPAT is not meant to turn away or weed people out.

"It is designed to put the right people in the right jobs and to ensure we keep our recruits safe while doing so," he said.

OPAT scoring is gender neutral, he added. All Soldiers, male and female, must pass the same physical standards for their desired career field.

The test will be administered to everyone coming into the Army: officer, enlisted, active, Reserve and Guard, he said. It will be administered by any command responsible for Soldier assessions – including Recruiting Command and Army Cadet Command -- after the Soldier swears in but before he or she begins training.

FOUR TESTS OF OPAT

OPAT measures muscular strength, muscular endurance, cardiorespiratory endurance, explosive power and speed. It consists of four individual tests:

- The "standing long jump," is designed to assess lower-body power. Participants stand behind a takeoff line with their feet parallel and shoulder-width apart. They jump as far as possible.
- The "seated power throw," is designed to assess upper-body power. Participants sit on the floor with their lower back against a yoga block and upper back against a wall. They hold a 4.4 pound (2 kilogram) medicine ball with both hands, bring the medicine ball to their chest and then push or throw the medicine ball upwards and outwards at an approximate 45 degree angle. The throw is scored from the wall to the nearest 10 centimeters from where the ball first contacts the ground.
- The "strength deadlift," is designed to assess lower-body strength. Participants stand inside a hex-bar and perform practice lifts to ensure good technique. They then begin a sequence of lifts starting with 120 pounds, working up to 220 pounds.
- The "interval aerobic run," always performed last, is designed to assess aerobic capacity. The evaluation involves running "shuttles" or laps between two designated points that are spaced 20 meters apart. The running pace is synchronized with "beeps," produced by a loud speaker, at specific intervals. As the test progresses, the time between beeps gets shorter, requiring recruits to run faster in order to complete the shuttle. Participants are scored by the level they reach and the number of shuttles they complete.

FOUR PHYSICAL DEMAND CATEGORIES

Here is a quick breakdown of the four physical demand categories incorporated into the OPAT:

- "Black" is for MOSs with heavy physical demands, like those of the combat arms branches, that require lifting or moving 99 pounds or more.

To attain black on the OPAT, the recruit or Soldier would need to achieve a minimum of 5 feet, 3 inches in the standing long jump; 14 feet, 9 inches for the seated power throw; 160 pounds for the strength deadlift; and a 10:14 minute mile over the course of 43 shuttles.

- "Gray" is for MOSs with significant physical demands that require frequent or constant lifting of 41 to 99 pounds and occasional tasks involving moving up to 100 pounds.

To attain gray on the OPAT, the recruit or Soldier would need to achieve a minimum of 4 feet, 7 inches in the standing long jump; 13 feet, 1 inch for the seated power throw; 140 pounds for the strength deadlift; and a 10:20 minute mile over the course of 40 shuttles.

- "Gold" is for MOSs with moderate physical demands, such as cyber, that require frequent or constant lifting of weights up to 40 pounds or when all physical demands are occasional.

To attain gold on the OPAT, the recruit or Soldier would need to achieve a minimum, 3 feet, 11 inches in the standing long jump; 11 feet, 6 inches for the seated power throw; 120 pounds for the strength deadlift; and, a 10:27 minute mile over the course of 36 shuttles.

- "White" is unqualified.

A recruit or Soldier who attains white has failed to meet OPAT's minimum standards.

Sutton noted that if a recruit fails the OPAT, he or she can request to retake the test. If the recruit cannot eventually pass the OPAT color designator for his or her MOS, it could be possible to renegotiate the contract that would allow the recruit to go into an MOS with a lower physical demand OPAT category, the minimum being Gold.

(David Vergun can be followed on Twitter: @vergunARNEWS.)

ARNEWS reporter Todd Lopez contributed to this report.

Black History Month

Photo: National Archives

Originally known as the 15th New York, an African-American regiment in a segregated Army and National Guard, the men of the 369th Infantry Regiment distinguished themselves in combat in World War I, fighting with the French Army. The Soldiers pictured here received the French Croix de Guerre for their heroism. The Soldiers called themselves the "Rattlers" but are best known for the nickname the "Harlem Hell Fighters."